

# **Inequality and Democratic Representation in Latin America: Regional and Interpersonal Effects on Government Spending**

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## **Introduction**

Latin America has the highest inequality of any region in the world. Uneven distribution of income fundamentally threatens the continuance and quality of democracy in the region. Unequal democracies face threat from both the rich, who fear redistribution to the poor majority, and the poor, who see existing institutions as unresponsive to their demands (Acemoglu and Robinson 2006). Related to this, inequality may have distorting effects on the party system and encourage clientelism (Fox 1994). The quality of democratic institutions, including voter turnout especially amongst the poor, is also known to be worse where income is more disparate (Solt 2010). These dynamics are troubling in any nation, but are particularly so where nascent democratic institutions and young governments may not be able to manage these conflicts.

This study addresses the role of inequality in Latin America from a different approach than nearly all previous work. I focus on the threats to democratic quality that may come from interregional inequality—divergence in income level and economic productivity across geographic regions within a nation. I compare these effects to those expected from interpersonal inequality, and examine how democratic political institutions structure attention on these distinct types of inequality. The modest goal of this chapter is to show a systematic difference between interpersonal inequality, the unequal distribution across individuals, and interregional inequality. Latin America has long been discussed as the region of the world with the highest interpersonal income inequality. The data below show that Latin America also has the highest level of interregional inequality of any global region.

Using a new dataset on interregional inequality, interpersonal inequality, and government spending in Latin America, I show that these types of inequality show different incidence and effects. Not only are these types of inequality conceptually distinct, they also drive divergent government behavior. I address the classic political economy concern with the effect of inequality on government spending, applying the existing theoretical work to interregional as well as interpersonal inequality. I find that while interpersonal inequality tends to prompt higher government spending to address social ills in the region, interregional inequality has an opposite and robust effect to drive down government spending as regions become more lopsided. This finding alone has implications for the quality of democracy if indeed the regional demand for redistribution is disconnected from its supply.

This study takes a cautious further step to address whether certain political institutions may condition government responses to inequality. I suggest electoral rules vary in their attentiveness and reactions to regional versus interpersonal concerns. Some nations have electoral systems more attune to the challenges of interpersonal inequality, namely centralized, strong party systems with broad social constituencies. Other countries' national institutions are more clearly geographic in orientation, with decentralized political and administrative systems and strong personal vote connections to local zones. How and whether nations address these challenges of inequality will depend fundamentally on how political bargains are struck in nations and the incentives of politicians to represent constituents.

The paper is structured as follows. First I address the concept and incidence of interpersonal and interregional inequality within Latin America and in comparative perspective with the rest of the world. Second, I suggest theoretical reasons why interpersonal and interregional inequality may drive conflict in governments and different ways these conflicts are managed within democratic political institutions. Third, I show empirical results on the relationship between inequality and government spending and the interaction between inequality and political institutions on government spending. Finally, I link the findings in this paper to the quality of representation for the less privileged in Latin America's democracies.

### **Background: Inequality and Democracy in Latin America**

The historic focus of inequality and democracy in Latin America has been on the uneven distribution of income and resources (especially land) amongst individuals within a nation (Acemoglu and Robinson 2006; Boix 2003). Interpersonal inequality is the concept that motivates nearly all studies (and quantitative measures) of inequality in academic and policy research. This focus on distribution amongst individuals is appropriate and important but does not paint a complete picture of politically relevant inequality. Most countries, especially in the developing world, have wide variance in administrative and political authority within their territory and weak mechanisms for government distribution across individuals and regions. Moreover, democratic politics in most nations of the world are organized spatially, around geographic jurisdictions, rather than individuals. Geography, and distribution across regions, is thus important to politics in many nations, and inequality of individuals and regions is irrevocably intertwined. To advance our understanding of distributive conflict in Latin America, we need to consider in more detail how inequality across regions influences political outcomes and thus democratic quality.

Latin America, like much of the developing (but also the developed) world, is characterized by uneven development and agglomeration around a central city. In most nations the population of largest city dwarfs the size of any other city. In Latin America, the examples of population concentration come easily to mind—the megacities of Mexico City, Buenos Aires, and São Paulo dominate the population and economic activity of their respective nations. Latin America is a highly urbanized region of the

world, second only to the wealthiest OECD nations in urban population, and much of this population is concentrated in one city center. These cities in Latin America are modern, economically diverse, and reminiscent of their counterparts in the developed world. However, much of the area outside of the capitals of Latin American countries is set apart by economic stagnation and depressed development (Sawers 1996).

The history of any country is structured by distributive conflict between social groups (rich and poor classes) but also between regions and economic sectors. The wealthy in agricultural regions, for example, may have fundamentally different economic interests from the wealthy in industrial regions. Their attitudes toward redistribution, trade openness, and government investment may be more strictly opposed than those of rich and poor within the same sectors and regions (Cusack, Iversen, and Soskice 2007). National policies strongly affect interpersonal distributions of income, of course, through labor and social welfare policies. Central policies are perhaps even more critical, however, to adjudicating between regions and economic sectors through laws addressing trade policy, taxation and subsidization, and fiscal federalism. Import Substitution Industrialization provides a cogent example of political adjudication of regional interests in Latin America.

Regional inequality is largely absent from politics research for both theoretical and empirical reasons. Historical accounts of inequality in most nations have typically centered on class interests, in narratives motivated by the experience of class conflict in Western European nations. Additionally, the measurement of inequality has focused nearly exclusively on individual or household distributions of income quintiles, through indicators such as the Gini coefficient and the ratio of low to high incomes (e.g., 90/10 quintiles, 50/10 quintiles). This chapter is meant to address both gaps in this literature, by raising theoretical reasons to focus on regional distributive conflict and its role in democratic quality, and adding quantitative evidence to begin to explore these questions.

Tables 1a and 1b here: Inequality in Latin America and the World, 2000-2010

In Table 1a, above, the incidence of interregional inequality is shown for available Latin American countries for the period 2000-2010. The measure listed is the population-weighted coefficient of variance in regional GDP per capita, discussed in more detail below. It is apparent in the table that the level of interregional inequality in the region varies quite widely, from the low in Bolivia to the high in Mexico. The large federations of Latin America have strikingly high levels of interregional inequality. Not surprisingly, differences in regional income are a pervasive political concern in Argentina, Brazil, and Mexico. Even the countries with relatively low levels in comparison to their neighbors, such as Bolivia or Colombia, are nonetheless on the upper side of the global scale.

Table 1b features average values of global regions to compare Latin America to other parts of the world, again in the period 200-2010. Table 1b reveals that the Latin American region has very high levels of interregional inequality. This level is particularly striking in comparison with Western Europe. Each Latin American country has interregional inequality levels higher than each Western European nation. In fact, if you

exclude Indonesia (the highest value in the world) from the South East Asian sample, Latin America has the highest inequality of any global region. These simple charts reveal the potential relevance of the question of interregional inequality to the political environment of Latin America today.

The interregional measures of inequality shown above are calculations of coefficients of variance in regional GDP per capita. The regional unit used in this study is the state, province, or department as defined by the nation itself. The conceptual analog is to the U.S. state, although the powers designated to those units clearly vary across nations. The coefficient of variance aggregates the values of regional GDP to one value for a nation that is comparable across nations. The interregional inequality measure shown above is weighted according to regional population, on the assumption that regional wealth or poverty is more politically meaningful when attributed to a large segment of the population. The calculation formula and the summary statistics for nations in the sample are shown in Figure 1 and Appendix Table A1.

A few examples provide some context for the regional gaps in Latin America that are apparent in these indicators. In Argentina, the city and province of Buenos Aires together produce nearly 70% of national GDP. Thus, two provinces out of 24 generate the vast majority of economic output, and 19 of 24 produce less than 1% of GDP each. Of course, the measures use regional GDP per capita, rather than GDP, meaning certain provinces with high productivity relative to very sparse population (such as Santa Cruz or Neuquén) dampen the statistical effect of what is highly lopsided economic output. Similarly, São Paulo in Brazil and the federal district of México alone produce 33% and 16% of GDP respectively. Bogotá produces 25% of GDP in Colombia. These figures indicate a geographic concentration of economic might within Latin American countries.

These simple summary statistics reveal a notable difference between inequality in Latin America and the rest of the world. In the sections below, I apply these new data to much-studied relationships between inequality and redistributive politics in the political economy literature. As the most common entry point into this literature, I examine the differences between the two types of inequality for their effect on total government spending. Next I address the role that political institutions play in this distribution—what incentives do politicians under different systems of representation have to deliver goods to social groups or regions.

### **Theory- Inequality and Government Spending in Latin America**

Inequality encourages political conflict as rich and poor groups articulate different preferences for government spending. In the most simplistic formulation of economic reasoning, rich groups should press for lower government spending under increasing inequality. In a progressive tax system, government spending is inherently redistributive—those who benefit from government spend less to consume it. Poor groups should have opposite preferences, pressing for more redistributive government spending as inequality grows. These dynamics have been almost exclusively attributed to rich and poor individuals, most famously through the Romer-Meltzer-Richard model (hereafter

RMR- Romer 1975; Meltzer and Richards 1981).<sup>1</sup> They can also be reasonably attributed to regional actors, who face similar incentives to block or advocate redistribution. Rich regions, like rich individuals, should hope to limit government spending and, under certain institutional conditions, have the means to do it (Giuranno 2009; Lee and Rogers 2014).

Where politics is structured and resources administered along geographic lines, politicians and voters are incentivized to evaluate distributional concerns in terms of their region (Beramendi 2012). Certain political institutions, notably geographic constituencies, federalism, “personal vote” elections, and to some extent presidentialism, territorialize political competition (Rogers 2015). In contrast, parliamentarism, closed list proportional representation, and unitarism have centripetal effects—they encourage focus on national politics (Gerring, Thacker, and Moreno 2005).

Where resources are divided to provinces or districts, politicians push to maximize resources going to their district, regardless of whether they prefer fiscal constraint or expansion at the national level (Rehfeld 2005). Federalism, bicameralism, electoral rules, and even the presidential-parliamentary distinction not present in Latin America, inform politicians and voters about whether they should think primarily in terms of their districts or their social group, or both. All political systems have some concept of both geography and social group representation, of course, but most systems fall closer to one or the other. Chile, for example, has very nationally-oriented politics, while Colombia is a strongly local political system. These institutional features shape the distributive debate in a nation to be either more concerned with local public goods or with broad social goods (Milesi-Ferretti et al., 2002).

The primary reason politicians in geographically-oriented systems focus on local allocation is that politicians’ careers depend on pleasing their districts. This takes different forms depending on the structure of political institutions. For U.S. politicians, this means bringing home pork to their districts to win reelection (Grimmer 2013). For Argentina and Brazil, federalized career paths incentivize attracting central transfers to the coffers of governors. In Chile, politicians’ career paths depend more on national parties that aim to please social constituencies that span regions (Harbers 2009). Political institutions fundamentally shape whether politicians (and voters) evaluate the national distributive game in regional terms.

The examples above of the USA, Argentina, and Brazil provide clear examples of institutions that influence distributive structures in national politics. First, the U.S. localized credit claiming is attributed primarily to the personal vote, which stems from single member district simple plurality systems for members of Congress (Cain et al. 1987). All legislators in the United States (and some in Latin America) are elected according to these rules, which motivate members to bring resources back home. In Argentina, there is not an equivalent “personal vote” because members are elected through closed list proportional representation. However, list access is determined by

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<sup>1</sup> These behavioral assumptions have been questioned. See Ansell and Samuels (2010) and Dion and Birchfield (2010).

local party leaders, typically the governor. Accordingly, the nomination process for national legislators makes politicians think about national policy in provincial terms (Jones et al. 2002). Open list proportional representation in Brazil incentivizes credit claiming for politicians that must compete within their own party lists. Bringing resources to their home territory is one way to distinguish themselves, although the specific geographic pull is less clear than in single member districts (Samuels 2002).

In this analysis, I focus on the effects of electoral rules, as opposed to the more obvious choice of federalism, on the territorialization of politics. Importantly for both the theoretical implications and the empirics, the design of electoral rules is not obviously endogenous to regional disparity. The case has been made that the design of federalism is endogenous to regional inequality (Bolton and Roland 1997; Beramendi 2012). The design of electoral rules has been argued to be endogenously driven by class conflict, but not regional inequality (Boix 1999; Cusack, Iversen and Soskice 2006). Variation in electoral system design in Western Europe, for example, has been attributed to concerns with income redistribution and social insurance (Boix 1999; Iversen and Soskice 2006). Class conflict may have regional implications, of course, but the primary motivation for electoral rule design appears to be whether incumbent groups can win a majority, or will need to share power with rising socialist parties. In this regard, electoral rules that territorialize politics may be plausibly exogenous to concerns of regional inequality per se. Of course, this question remains for future research.

The dynamics of regional preferences are not as straightforward as those of individuals.<sup>2</sup> While rich regions may want to keep their resources within their borders, there is individual heterogeneity within those borders. More specifically, rich regions have both rich and poor individuals with different preferences for government spending. Under different institutional and economic conditions, poor or rich groups can form coalitions across regional borders to maximize their gains as social groups, rather than regional units (Beramendi, Rogers, and Diaz-Cayeros 2015). Just as with regional interests, therefore, the institutional structure of national politics should be crucial to how and whether groups of individuals or regions are able to collectively act to attain their policy preferences.

This introductory empirical investigation of regional and interpersonal dynamics will test two primary questions: what is the effect of regional inequality on government spending? And, how do political institutions condition the effect of inequality on government spending? These questions are complex and the empirical analysis is necessarily preliminary, so the theoretical explanation will be kept short and concise, relying on existing theories with specific application to regional dynamics in the Latin American context in particular.

## **Theoretical Expectations**

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<sup>2</sup> This is not to say that the preferences of individuals for redistribution are uncontroversial or straightforward. A lively debate in the American and Comparative literature is working to sort out the psychological and political economy motivations for individual preferences for government spending.

The RMR model of interpersonal inequality shows that increasing inequality should drive higher government spending. In this theory and its extensions, the decisive median voter will push for higher government spending as inequality grows. The median voter, who grows poorer relative to the mean voter with rising inequality should advocate more government spending that is increasingly redistributive as incomes become more uneven in a progressive tax system. The simplified model of this theory has been largely dismissed for empirical and theoretical reasons in comparative political economy. The empirical predictions are not born out in the data—in fact the opposite is often shown to be more accurate—inequality drives down government spending rather than increases it (c.f., Alesina and Glaesar 2004; Benabou 2000; Gouveia and Masia 1998).

One reason for these weak empirical findings is the inadequate portrayal of the political process in the RMR model. That the median voter is decisive (or more cogently that the full spectrum of individuals vote) has been seriously refuted in formal and theoretical models (Benabou 2000; Gerber and Lewis 2004; Beramendi 2007; Bartels 2009). More importantly for the purposes here, RMR assumes a form of political representation—a single district with direct democracy—that is far removed from politics in any nation. Rather, nations divide their territory into voting districts, most often in geographic units, and establish a range of actors with veto authority able to halt the interests of the aggregate median voter. Regional inequality will press distributive conflict that discourages cooperation and coordination to boost government spending. For a large sample of countries, Lee and Rogers (2015) have shown that political institutions empower regions to constrain government spending through veto authority and enable poor individuals to increase government spending through majority power. As interregional inequality grows, therefore, rich regions should have greater incentive to block spending, leading to my expectation in Hypothesis 1.

*Hypothesis 1:* higher interregional inequality drives lower government spending.

Electoral systems structure the bargaining dynamics of politicians, whether on the grounds of interpersonal or interregional inequality. By dividing nations into regional electoral units, the interests of regions are highlighted and voter incentives to express preferences on a regional basis become more likely. Electoral systems affect whether politicians think more in local or national terms, increasing or decreasing the relevance the region-specific preferences. In this manner, incentives created by electoral systems interact with inequality to influence government distribution.

*Hypothesis 2:* Electoral institutions interact with regional inequality to shape government spending.

## **Research Design**

The basic statistical model for hypotheses 1 and 2 is listed below:

$$\text{Total Government Spending/GDP} = \beta\text{Regional Inequality} + \beta\text{Interpersonal Inequality} + \beta\text{Regional Inequality*Personal Vote} + \beta\text{Interpersonal Inequality*Personal Vote}$$

$+ \beta \text{Personal Vote} + \beta \text{Population}(\log) + \beta \text{Trade Openness} + \beta \text{Capital Openness} + \beta \text{GDP per capita}(\log) + \beta \text{GDP Growth} + \beta \text{Ethnic Fractionalization} + \beta \text{Population over 65} + \beta \text{Federalism} + \varepsilon$

### *Dependent Variables*

The very large literature on the effects of income inequality on government policy typically begins with an analysis of government spending overall and redistributive spending (typically social transfers) in particular. This analysis is a comparison of interregional measures of inequality to interpersonal measures of inequality, so I employ this most common measure, government spending, as the primary dependent variable. Of course, other dependent variables are highly relevant and will be explored in the future. For this preliminary research, I prefer to evaluate the effects of inequality as they have been traditionally measured in the field so that scholars can have a direct “apples to apples” comparison.

Within the government spending categories, I use two common measures—General Government and Central Government expenditures.<sup>3</sup> General government refers to spending at all levels of government (central, state, local). Central government expenditure is restricted to resources distributed by the national government. In theory, the central government variable may seem the most appropriate for evaluating the effects of regional inequality on national policymaking. The framework I have provided is one in which representatives of regions and social groups come to the national bargaining table to divide up the spoils of the central government. However, I think it is appropriate to consider general government expenditures for at least two reasons. First, one primary effect of fiscal federalism (which would only be captured in general government measures) is for sub-national regions to tax and spend to their own preferences. Expenditures in jurisdictions below the national level could be strongly affected by regional inequality as rich territories spend at high levels to their preferences and tax bases, and poorer areas have fewer resources to distribute. Moreover, poor regions are subsidized with (somewhat) progressive national transfers that plump their spending.

Second, regional inequality may be endogenously related to the fiscal structure of a nation (Beramendi 2012). That is, rich regions may prefer to decentralize many government functions so that they can consume to their preferences without subsidizing poorer regions. Regional inequality in this case would not necessarily reduce government spending but shift its geographic incidence. In that case, central government spending would still be the best theoretical indicator of the effect of regional inequality on shared resources, but the comparison with general government spending would provide a more complete picture of its overall impact.

### *Independent Variables*

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<sup>3</sup> A summary of variables and sources is shown in Appendix Table 1A. The sample of the central government spending is smaller because of missing data in the dependent variable. No central spending data is available for Ecuador.



Regional development has long been a topic of interest in political geography and economics but not much explored in political science due, in large part, to a dearth of data and theoretical models devoid of geography. This study utilizes a large dataset of interregional inequality collected from 50 nations around the world for the period 1980-2010 (Lee and Rogers 2015).<sup>4</sup> The focus of this examination is the nine available Latin American countries (Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Mexico, Panama, Peru), with comparison to results for the entire sample. Although not all Latin American countries have available data, those countries included account for the vast majority of citizens and economic productivity in the region.

The interregional inequality measures used in this analysis are country-year observations synthesizing region-level GDP per capita data for each country. I employ the population-weighted coefficient of variance of regional GDP per capita.<sup>5</sup> The formula for this measure is shown below, with  $y$  representing regional gdp per capita,  $n$  the number of regional units, and  $p$  the population. This indicator is calculated independent of the number of regions considered, is not sensitive to shifts in average GDP level, and satisfies the Pigou-Dalton principal.<sup>6</sup>

Figure 1 here: Calculations of Regional Inequality Measure

Importantly, regional inequality is not fixed in Latin America. Several of the nations included experienced significant changes in regional inequality in the period under examination. For example, in Bolivia, the regional inequality value fluctuated between .2 and .39, a nearly 100% difference between the minimum and maximum value between 1988 and 2011. Notable changes are also observable in regional inequality México and Chile, with fluctuations of 50% between the minimum and maximum observed value. Other countries' values, such as Peru and Panama, were relatively static. Figure 1A and Table 3A in the appendix show changes over time in the Latin American sample nations, and descriptive statistics by nation. Overall regional inequality fluctuates somewhat less in the Latin American (standard deviation=.14) than in the global sample (standard deviation=.20) but the changes are nonetheless notable. In comparison, the Gini coefficient of income inequality has a standard deviation of .04 in Latin America and .09 in the global sample. This variation over time makes the regional inequality data plausibly suitable for time-series, cross-sectional regression analysis.<sup>7</sup>

I compare the effects of interregional inequality to available measures of interpersonal inequality, namely the Gini coefficient. The Gini coefficient is the most widely used measure of interpersonal inequality and it is based on a nationally aggregated concept of

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<sup>4</sup> All 50 countries cannot appear in the empirical results because of missing data in the independent variables.

<sup>5</sup> The results are also robust to alternative measures of regional inequality—the regional gini coefficient and the unweighted coefficient of variance.

<sup>6</sup> An arithmetical transfers from rich to poor regions reduces inequality (Dalton 1920, Pigou 1916).

<sup>7</sup> With care taken to address the challenges of the data, discussed more below.

inequality between quintiles of income.<sup>8</sup> Of several available cross-national datasets of interpersonal inequality, I use Frederick Solt's data, the Standardized World Income Inequality Dataset. This data has advantages both in coverage (which tend to be spotty in Latin American countries) and in distinguishing income before (gini market) and after (gini net) government transfers. For theoretical reasons, I use the gini market value in the regression analysis. I am looking for the effect of inequality on government spending, therefore the gini market value provides a cleaner indicator because it excludes government taxation and spending in its calculations. Intraregional inequality is also a relevant distributive concern to national politics but data are sparse, even in OECD countries and are not commonly collected by Latin American countries (see Beramendi, Rogers, and Diaz-Cayeros 2014). Accordingly, I cannot include these values in the analysis.

The theoretical focus of the chapter is on the interaction between inequality and political institutions. I focus in this preliminary research on the effect of electoral rules, although I recognize many other institutions can influence these dynamics (Rogers and Lee 2015). Accordingly, I measure political institutions to capture the incentives of politicians to deliver resources to social or geographic constituencies with a measure of the personal vote (Carey and Shugart 1995; Johnson and Wallack 2007). The personal vote is not, by definition, a geographic concept but tends to relate highly to the spatial orientation of a country's political institutions.

The personal vote is the relative value of an individual politician's reputation to her party's reputation in the electoral fate of that politician. The personal vote is high when politicians must distinguish themselves on personal characteristics rather than party characteristics. This highlights the intraparty conflicts as well as the localized incentives that are the focus of my theoretical development. The personal vote measure is an additive index of ballot structure (takes a value of 2 if parties do not control access or ordering of candidates; 1 if parties control access or order; 0 if parties control both access and ordering), vote pooling (2 if votes are not pooled, 1 if votes pooled across some members in a district, 0 if votes polled across all members), vote type (2 if voters cast a vote for one individual candidate; 1 if voters cast a vote for a party; 0 if voters cast one vote for a party), and district magnitude (Johnson and Wallack 2007).<sup>9</sup> For each component of the index except the district magnitude, a higher value implies a higher personal vote.<sup>10</sup>

For my purposes, I am concerned with the extent to which politicians must think about their local jurisdiction more than the nation as a whole. I argue the same electoral system

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<sup>8</sup> For a thorough description of the calculation of the Gini coefficient and the data collection process and methods see Solt (2009).

<sup>9</sup> Vote type = 1 if a vote for an individual is observationally equivalent to a vote for a party, such as in single member districts.

<sup>10</sup> Carey and Shugart (1995) show that district magnitude interacts with ballot structure in PR systems. As district magnitude rises in closed list systems, the personal vote declines. As district magnitude rises in open list systems, parties have more competitors from which to distinguish themselves, so the personal vote rises.

structures that tend to cultivate personal reputations are also those most likely to encourage geographic-focused representation. Although this is not a perfect measure of the concept, it does provide a reasonable proxy for the geographic orientation of an electoral system. The average values of the personal vote scores, by Latin American country is shown in Appendix Table 2A.

### *Control Variables*

When measuring government spending, several economic and demographic characteristics are necessary to isolate specific political effects. The first is level of development, measured with the log value of gross domestic product per capita (GDPPC) corrected for purchasing power parity. This variable helps to control for “Wagner’s Law” which predicts higher government spending as countries grow richer. Second is population, again logged, because larger populations might offer returns to scale in delivery of public services (the numerator) or increase productive capacity (the denominator). The third is an age ratio, the percentage of the population over 65. In developed countries, this is an important variable to capture the size of the population dependent on government health and income subsidies. This variable may not be quite as relevant in certain Latin American countries, but should play a role in places such as Argentina, Chile or Mexico, with notable pension systems.

I include ethnic fractionalization because some studies have found social expenditure is lower where ethnic heterogeneity (and presumably ethnic tensions) is high (Alesina, Baqir, Easterly 1999). This may be important, in particular, in the countries with considerable indigenous populations such as Bolivia and Peru, and racial diversity such as Brazil. Globalization, measured as trade openness and capital openness, also control for the likelihood that countries with open borders are constrained from taxing at high levels to provide government services. With very open markets, this variable could be even more important in Latin American countries (Wibbels and Arce 2003).

Political institutions other than electoral rules may have similar effects on the territorial scope of national politics. Most importantly, federalism should orient budgets and politician behavior more toward the regions than unitary systems. Federalism is particularly important to explaining central government expenditure, which should be low relative to unitary systems because significant fiscal activity occurs at the sub-national level. I also control for institutions that may influence the speed and veto authority in the budget process, including the presidential budget authority (Alesina et al. 1999) and territorial bicameralism in alternative models. The budget authority is very similar (and high) for the president in the included countries, with the possible (relative) exception of Peru. Bicameralism is frequently linked to territorial politics and is present in the bigger (and more decentralized) countries in the sample. Only Chile features a unitary system and bicameralism in the sample. I exclude country fixed effects because I am concerned primarily with the variance across countries on regional inequality and political institutions. The political institutions are fixed in the sample, with the exception of Bolivia, prohibiting over time within country comparisons. Regional inequality does change over time in the sample but it is a slow-moving variable. Accordingly, cross-

country comparisons offer more theoretical and empirical value in this initial examination.

### *Estimation Techniques*

Predicting government spending requires several adaptations to the standard ordinary least squares model to correct for violations of its assumptions. Throughout, I employ panel corrected standard errors (PCSE) (Beck and Katz 1995). I control for autoregression in spending with the lagged dependent variable, or alternative, an AR1 process, to reduce the considerable variance absorbed by the lagged dependent variable.<sup>11</sup> In the models presented in the body of the text, I focus on PCSE models with AR1 autocorrelation.

### **Results**

Interregional inequality has a consistent effect of reducing government spending relative to GDP in a cross-national sample. This result, and its comparison with interpersonal inequality, is shown in Table 2 below. This effect is thoroughly documented for the Latin American cases below (and in the appendix) and holds true for the larger sample of all available countries with regional inequality data on the right side of Tables 2 and 3 (see also, Lee and Rogers 2014). Whether the dependent variable is general or central government spending, a rise in interregional inequality is associated with a reduction in government output.

Table 2 here: Effect of Inequality on Government Spending, % of GDP

Interpersonal inequality, measured with the Gini coefficient, appears to have a strong, positive effect on government spending in the Latin American sample. In the global sample, the effect is highly inconsistent and often negative.

The control variables perform largely as expected. The personal vote is associated with increased spending in the Latin American sample but has no clear effect in the full sample. Importantly, the personal vote is not a proxy for regional conflict, but for territorialized political institutions.<sup>12</sup> Territorial orientation of politics may very well incentivize overspending on pork by districted politicians who have little regard for the national budget (Weingast, Schepsle, Johnsen 1981). However, nationalizing political institutions may also encourage overspending as politicians collude to extract rents (Persson, Roland and Tabellini 1997). There are conflicting expectations for how the personal vote should impact government spending overall but district-targeting incentives

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<sup>11</sup> In addition models not show here I control for possible non-stationarity in the dependent and independent with moving averages in the inequality variables, and full estimations with 5 year fixed and moving averages. A full empiric treatment of these data, including an instrumental variables approach, is available in Lee and Rogers 2014.

<sup>12</sup> In the Latin American sample, in fact, the personal vote is negatively correlated with regional inequality. This may suggest that pork encourages regional convergence, or that regionally disparate societies purposefully choose nationalizing voting rules, or they are unrelated.

will is likely to drive down social spending in the national budget (Milesi-Ferretti et al. 2002).

The effect of trade on spending is negative, although capital openness has an ambiguous, and sometimes positive effect on spending. There's no evidence of the "Wagner Effect"- that higher GDP per capita drives increased spending, in the Latin American or general sample. Contrary to broad expectations, in the Latin American sample ethnic fractionalization is associated with higher government spending relative to GDP. The association is negative in the full sample but not significant. The effect of ethnic fractionalization may be driven in the Latin American sample by the relatively high spending and high fractionalization in Brazil, Bolivia, and Colombia. GDP growth is associated with reduced spending, likely because the denominator grows and spending does not keep pace.

The effect of interregional inequality on spending in Latin America is the opposite of that on interpersonal inequality. While differences in income across individuals drives higher government spending, as regions become more unequal, the generosity of national expenditure declines. This is an important difference in the nature of inequality and its relation to government that has not been previously theorized or tested in Latin American countries. The important question becomes, why, in Latin American countries, does distributive conflict manifest itself in two distinct ways. Why do the preferences of rich regions win out in Latin America while the desires of the poor individuals appear to shape changes in government spending? Two of many possible answers will be discussed here. First, it is possible that rich regions are also unequal regions (such Buenos Aires), so rich regions may align with poor regions for social spending that will benefit their poor individuals but dampen spending that will redistribute to other, poorer, regions. This is unlikely in Brazil and Mexico in which the rich regions are also more equal. It is plausible in Argentina, but unknown in the other countries in the sample (Beramendi, Rogers, and Diaz-Cayeros 2014).

Another possibility that I can test more directly, is how the electoral rules shape political winners and losers. Does the political system give incentives for politicians to cater to geographic regions or to social classes? If politicians are rewarded for representing the poor as a group, for example, we should expect interpersonal inequality to drive higher government spending. If, however, all politics is local, then politicians should advocate geographically based resources as interregional inequality increases. This is examined below with the electoral system variables from Latin America.

#### Conditional Effects: Inequality under Different Electoral Systems

The very simple theory I offered above is that politicians should care about different constituencies depending on electoral rules. If electoral rules incentivize politicians to deliver goods to national social groups, regional concerns should be less important. If electoral rules motivate locally-oriented thinking, politicians will debate geographically oriented spending with more fervency. What is unclear from this theory is what the general effect of inequality should be, given the electoral system. Does regional

inequality drive more or less spending in regionally-oriented political systems? Does interpersonal inequality drive a wedge between voters and politicians only in party systems oriented to social class? The interactive results of inequality based on electoral system help to sort these dynamics.

Table 3 here: Interactive Effect of Inequality and Electoral Institutions on Government Spending, % of GDP

The conditional effects of inequality, based on the electoral system, are featured in Table 3 above. Recall that the personal vote is measured as a ranking of electoral systems by Johnson and Wallack (2006). The higher the rank, the more personal-vote oriented is that political system. The lower the rank, the stronger is the party vote. Accordingly, when interpreting the statistical effect of interregional and interpersonal inequality under different electoral systems, I look for opposite signs to show similar effects and similar signs to show distinct effects. I expect interpersonal inequality to matter most in party vote systems (low personal vote rank) and interregional inequality to matter most in personal vote systems (high personal vote rank). “Mattering” within in an electoral system, of course, may mean higher or lower spending or no effect at all. This is what I explore in the marginal effects. The results of interaction effects are not easily read through statistical output. Accordingly, I have graphed the marginal effects of inequality, based on the electoral system, in Figure 1.

The results in Table 3 suggest several important things for the relationship between inequality and electoral systems in Latin America. First, the strong negative effect of regional inequality that we observe in all models is driven primarily by nationally-oriented electoral systems. Figure 2a, below, shows that in nationally-oriented political systems (personal vote value is low), the effect of interregional inequality on government spending is significantly lower. Regionally-oriented political systems (personal vote value is high) do not respond to regional inequality with lower spending—their spending is unchanged. Moreover, the overall effect of regional inequality to reduce spending is robust to all models.

Figure(s) 2a and 2b here: Marginal Effects, Latin American Sample

Second, the strong positive effect of interpersonal inequality on government spending in Latin America is also driven by those nations with nationally-oriented electoral institutions, shown in Figure 2b. In geographically-oriented systems, increased interpersonal inequality has no statistical effect on government spending.

What do these results suggest about the relationship between electoral systems and inequality on government spending in Latin America? First, it is clear that interpersonal and interregional inequality have divergent effects on government spending in Latin America and these effects differ depending on a nation’s electoral system. The results in the Latin American sample suggest that nationally-oriented electoral rules (in all except Brazil, Colombia, and recently Bolivia) depress spending as regional inequality grows.

These same nationally oriented systems push spending up to deal with increasing interpersonal inequality.

Essentially we see a null result for geographically-oriented political systems to changes in interregional inequality. This finding is important in itself because it suggests a particular dynamic in political bargaining, namely of resolving political conflict with pork barrel spending. Where politicians in nationally oriented political systems feel little motivation to redistribute to poor regions, in geographically-oriented political systems it appears that rich regions are not able to cut off the poor regions. The most straightforward explanation for this outcome may be in party bargaining. While most national political parties are diverse in regional representation they are often more coherently arranged on the issue of interpersonal inequality and redistribution. More simply, parties form precisely on the basis on individual income redistribution with broad regional representation. Accordingly, matters of interpersonal inequality are most often dealt with across parties while interregional inequality is a distinctly intraparty as well as interparty matter. These bargaining dynamics cannot be examined in this chapter but are considered in detail in Rogers and Lee (2014).

## **Conclusion**

What do these findings mean for the quality of democracy in Latin America today? Overall, I argue that regional economic differences impede national responses to inequality, and this may undermine the quality of democracy. Regions with distinct preferences have difficulty agreeing on policy reform and this may result in policy stagnation even on pressing concerns over income inequality. At the same time, there is some reason for hope that governments will make serious efforts to lower income inequality. The quality of democracy in the region, and the parties representing lower income constituencies appear to be stronger than in the past. Nonetheless, significant structural barriers stand in the way of major redistributive reform in Latin America.

The results above suggest that regional inequality is an impediment to redistributive government spending. Indeed, in complementary results, regional inequality is shown to be a strong predictor of lower fiscal redistribution, measured as the percentage decrease in the gini coefficient that results from government taxes and transfers (Beramendi, Diaz-Cayeros, and Rogers 2015). The theoretical mechanism that links regional inequality to lower redistribution is differences in policy preferences. Economically dynamic regions want different policies out of national governments than do stagnating regions and they have trouble coming together on a common policy. Not surprisingly, therefore, Latin American governments' responses has been limited in comparative perspective.

Yet Latin America's democracies have recently shown signs that addressing inequities is on their policy agenda. In the last decade, Latin American democracies have reduced income inequality and poverty to a significant degree through the efforts of their governments. Levy and Schady (2013) document how government programs to subsidize income to the poorest individuals in Latin America have resulted in substantial reductions in poverty (from 28% of the population below the poverty line in 1996 to 13% in 2011).

Lustig et al. (2013) show that higher and more progressive government transfers have contributed to reductions in income inequality in Argentina, Brazil, and México. Some of the economic conditions that made these reforms palatable, such as a commodities boom that has put more money in government coffers, may be ephemeral. Nonetheless, the passage and implementation of these reforms reflects a potentially important political change in the region. Democratic leaders appear more attentive to the demands of the majority poor in the region than they have been in the recent past.

The sources of those changes, and the reasons for hope, come from improvement in the quality and functioning of many of Latin America's democracies. After decades of concern that parties in Latin America were populist machines devoid of programmatic content, we now see increasing evidence that parties offer distinguishable platforms and voters are able to discern those differences (Baker and Greene 2011; Zechmeister 2006). This is particularly important for advancements in redistributive policies. For the interests of the relatively poor to be articulated in the political system, they need parties able and willing to press for their demands. The rise of leftist parties and improved income distributions in recent decades suggests that democratic politics has encouraged the representation of a broader segment of the population (Huber and Stephens 2012).

This positive outlook needs to be tempered by severe, lingering inequalities in the systems of representation that have clear implications for the likelihood of redistributive policy change. In particular, legislative malapportionment and enclaves of sub-national autocracy limit the voice of the poorest in many nations of Latin America (Gervasoni 2010a; Gibson 2005). Moreover, both are inextricably linked to the structure of regional inequality.

Latin America, especially Argentina and Brazil, is a region with substantial malapportionment (Samuels and Snyder 2001). Not coincidentally, those countries with uneven development are also those in which political representation is often disconnected from the "one person one vote" democratic ideal (Stepan 2004). Less populated and small regions have disproportionate political voice in these systems. This appears to be very important for the distribution of interregional transfers and redistributive reform. For example, Ardanaz and Scartascini (2013) show that nations with high malapportionment have low personal income tax collection. Low tax revenue and low progressivity in the tax structure limit redistributive options for governments. These authors argue that malapportionment allows anti-redistributive elites to buy the support of politicians from less populated (and thus cheaper to buy) regions (see also Gibson 1996 and Gibson and Calvo 2000).

Related to this, if regions are powerful actors in national politics it is important who is representing the interests of those regions. Despite national level democracy, some sub-national regions continue to be governed by autocrats (Gervasoni 2010b). The quality of sub-national democracy is much more variable than that of national democracy in Latin America (Gibson 2005). If politicians at the national level have incentive to treat all politics as local, and their local political environment is highly autocratic, then sub-



national autocracy may influence national democracy. One specific way this may occur is through decisions on interregional transfers.

While government support for the neediest individuals has often been lacking, many Latin American nations transfer considerable income across regions. In fact, intergovernmental transfers in Argentina, Brazil and Mexico, as a percentage of GDP, are comparable to those found in highly redistributive nations such as Germany (Beramendi, Diaz-Cayeros, and Rogers 2015). Economically productive regions subsidize the spending of less productive regions through centralized taxation. However, these transfers have not led to convergence in regional income (Delgado and Russo 2000). Malapportionment and sub-national autocracy help to explain the limited redistributive effects of intergovernmental transfers. Transfers are not progressive but reflect inequities in representation. Regional income is not a good predictor of regional transfers, but (low) population is a very strong predictor. Regional autocrats capture a high share of these transfers, which act like rentier resources (Gervasoni 2010a). Redistribution across regions thus reflects a specific political logic in many Latin American nations that is likely inimical to major initiatives to change existing levels of income inequality.

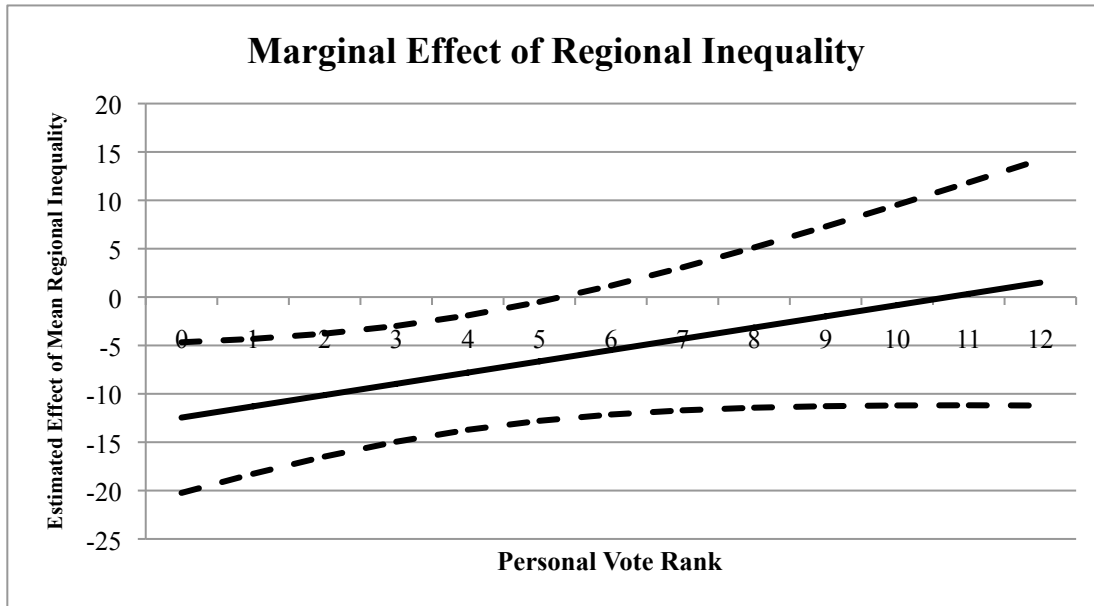
## Figures

### Figure 1: Calculation of Regional Inequality Measure

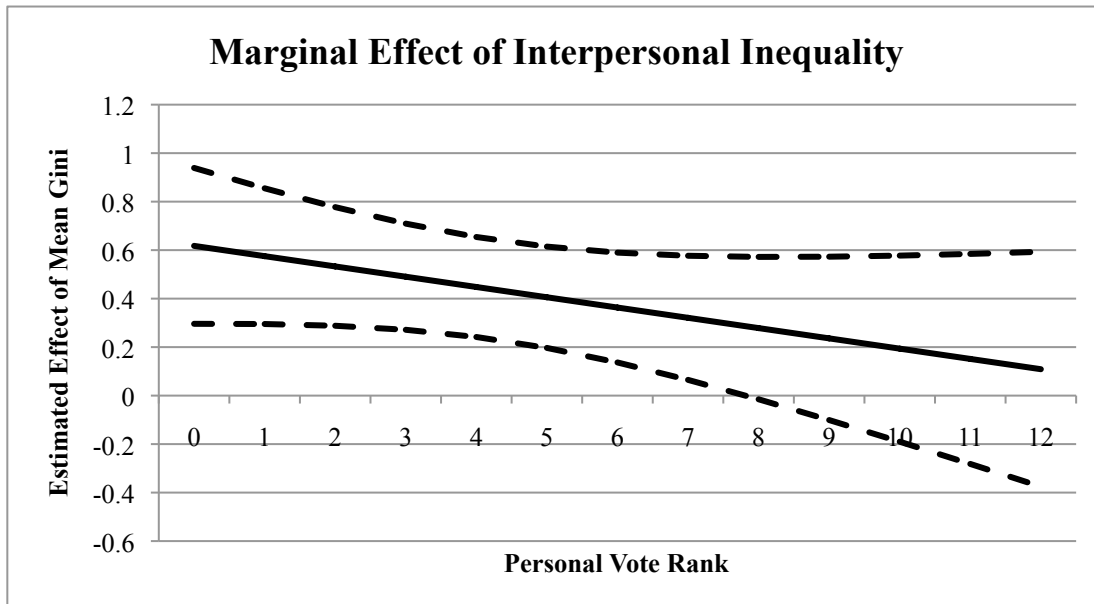
Coefficient of Variation, Weighted (*COVW*)- Populated Weighted Measure of Dispersion

$$\frac{1}{\bar{y}} \left[ \sum_{i=1}^n p_i (\bar{y} - y_i)^2 \right]^{1/2}$$

**Figure 2a: Marginal Effect of Regional Inequality by Personal Vote Rank, Latin America**



**Figure 2b: Marginal Effect of Interpersonal Inequality by Personal Vote Rank, Latin America**



**Tables****Table 1A: Regional Inequality in Latin American Countries, 2000-2010**

| <b>Country</b> | <b>Regional Inequality Score</b> |
|----------------|----------------------------------|
| Argentina      | 0.621                            |
| Brazil         | 0.485                            |
| Bolivia        | 0.306                            |
| Chile          | 0.421                            |
| Colombia       | 0.388                            |
| Ecuador        | 0.610                            |
| Mexico         | 0.719                            |
| Panama         | 0.483                            |
| Peru           | 0.495                            |

**Table 1B: Regional Inequality in Global Perspective, 2000-2010**

| <b>Global Region</b>                                     | <b>Regional Inequality Score</b> |
|--|----------------------------------|
| <i>Latin America</i>                                     | 0.477                            |
| Western Europe, North America, Australia and New Zealand | 0.206                            |
| Eastern Europe and Former Soviet Union                   | 0.373                            |
| East Asia  | 0.342                            |
| South East Asia  | 0.626                            |
| South Asia   | 0.402                            |

**Table 2: Effect of Inequality on Government Spending, % of GDP**

|                              | Latin American Countries                 |  | All Available Countries                  |  |
|------------------------------|--|--|--|--|
|                              | General Government Expenditure, % of GDP | Central Government Expenditure, % of GDP | General Government Expenditure, % of GDP | Central Government Expenditure, % of GDP |
| Regional Inequality          | -6.266**<br>(3.105)                      | -21.514***<br>(4.555)                    | -3.370***<br>(1.210)                     | -4.594**<br>(2.281)                      |
| Gini Coefficient             | 0.430***<br>(0.099)                      | 0.658***<br>(0.116)                      | 0.019<br>(0.028)                         | 0.181**<br>(0.077)                       |
| GDP Growth                   | -0.100***<br>(0.039)                     | -0.098**<br>(0.044)                      | -0.108***<br>(0.020)                     | -0.203***<br>(0.042)                     |
| Population over 65           | 0.983*<br>(0.588)                        | 3.122***<br>(0.434)                      | 0.525***<br>(0.101)                      | 1.619***<br>(0.231)                      |
| GDP Per Capita (logged)      | 0.403<br>(2.317)                         | 0.756<br>(2.563)                         | 0.000<br>(0.539)                         | -2.754***<br>(0.996)                     |
| Population (logged)          | 0.411<br>(0.644)                         | 0.645<br>(0.691)                         | -0.445*<br>(0.247)                       | -1.958***<br>(0.457)                     |
| Capital Openness             | 0.599*<br>(0.326)                        | -0.124<br>(0.292)                        | 0.119<br>(0.163)                         | -0.734***<br>(0.285)                     |
| Trade Openness               | -0.011<br>(0.017)                        | 0.056***<br>(0.017)                      | -0.009<br>(0.008)                        | 0.026<br>(0.017)                         |
| Personal Vote Rank           | 0.261**<br>(0.119)                       | 0.606***<br>(0.153)                      | 0.044<br>(0.070)                         | 0.1<br>(0.126)                           |
| Ethnic Fractionalization     | 11.687**<br>(5.509)                      | 24.462***<br>(6.301)                     | -0.391<br>(1.089)                        | -4.185<br>(2.772)                        |
| Federalism                   | 1.492**<br>(0.650)                       | 0.746<br>(0.602)                         |  |  |
| <i>Constant</i>              | -25.187<br>(22.126)                      | -49.890*<br>(25.643)                     | 13.918***<br>(5.060)                     | 38.252***<br>(9.639)                     |
| <i>R-squared</i>             | 0.518                                    | 0.842                                    | 0.586                                    | 0.614                                    |
| <i>Observations</i>          | 127                                      | 83                                       | 875                                      | 725                                      |
| <i>Countries</i>             | 9  | 8  | 45                                       | 42                                       |
| <i>Country Fixed Effects</i> | No                                       | No                                       | No                                       | No                                       |
| $\chi^2$ , F [Prob > F]      | 58.773 (0.00)                            | 200.935 (0.00)                           | 269.423 (0.00)                           | 332.485 (0.00)                           |

**Table 3: Interactive Effect of Inequality and Electoral Institutions on Government Spending, % of GDP**

|   | Latin American Countries                    |   |   |   |
|---|---|---|---|---|
|   | General Government<br>Expenditure, % of GDP | General Government<br>Expenditure, % of GDP | Central Government<br>Expenditure, % of GDP | Central Government<br>Expenditure, % of GDP |
| Regional Inequality                           | -12.457***<br>(3.971)                       | -5.883*<br>(3.193)                          | -27.505***<br>(6.436)                       | -18.187***<br>(4.161)                       |
| Gini Coefficient                              | 0.509***<br>(0.090)                         | 0.623***<br>(0.166)                         | 0.647***<br>(0.106)                         | 0.610***<br>(0.210)                         |
| Regional<br>Inequality*<br>Personal Vote Rank | 1.163*<br>(0.694)                           |   | 1.379<br>(1.229)                            |   |
| Gini Coefficient*<br>Personal Vote Rank       |   | -0.036<br>(0.028)                           |   | -0.004<br>(0.045)                           |
| Personal Vote Rank                            | -0.124<br>(0.241)                           | 2.086<br>(1.451)                            | 0.166<br>(0.437)                            | 0.85<br>(2.340)                             |
| GDP Growth                                    | -0.099**<br>(0.042)                         | -0.095**<br>(0.038)                         | -0.097**<br>(0.044)                         | -0.099**<br>(0.045)                         |
| Population over 65                            | 1.499***<br>(0.519)                         | 1.093*<br>(0.580)                           | 3.517***<br>(0.540)                         | 3.052***<br>(0.423)                         |
| GDP Per Capita<br>(logged)                    | -0.568<br>(2.041)                           | -0.348<br>(2.459)                           | -0.466<br>(2.592)                           | 0.006<br>(3.028)                            |
| Population (logged)                           | 0.47<br>(0.584)                             | 0.346<br>(0.628)                            | 0.587<br>(0.678)                            | 0.97<br>(0.695)                             |
| Capital Openness                              | 0.488<br>(0.328)                            | 0.641**<br>(0.327)                          | 0.035<br>(0.312)                            | -0.256<br>(0.264)                           |
| Trade Openness                                | -0.006<br>(0.016)                           | -0.014<br>(0.017)                           | 0.053***<br>(0.017)                         | 0.059***<br>(0.017)                         |
| Ethnic<br>Fractionalization                   | 12.666**<br>(5.123)                         | 10.632*<br>(5.555)                          | 24.463***<br>(6.209)                        | 23.389***<br>(6.755)                        |
| Federalism                                    | 1.505***<br>(0.552)                         | 1.666**<br>(0.661)                          | 0.968<br>(0.600)                            |   |
| <i>Constant</i>                               | -22.371<br>(20.120)                         | -28.398<br>(21.023)                         | -39.195<br>(25.675)                         | -41.979*<br>(25.398)                        |
| <i>R-squared</i>                              | 0.545                                       | 0.525                                       | 0.845                                       | 0.836                                       |
| <i>Observations</i>                           | 127   | 127   | 83  | 85  |
| <i>Countries</i>                              | 9   | 9   | 8   | 8   |
| <i>Country Fixed<br/>Effects</i>              | No  | No  | No  | No  |
| $\chi^2$ , F [Prob > F]                       | 90.782 (0.00)                               | 58.4 (0.000)                                | 254.528 (0.00)                              | 197.75 (0.00)                               |

## Appendix

**Table 1A: Summary Statistics and Variable Descriptions (Latin American Sample)**

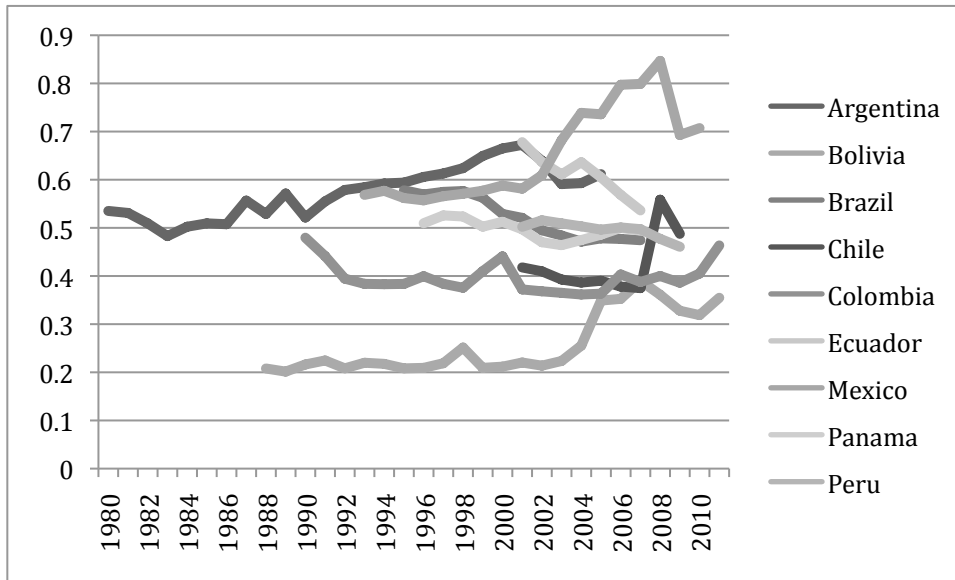
| Variables                    | Description   | Mean | Min  | Max  | SD   | Sources   |
|------------------------------|---|------|------|------|------|---|
| <b>Dependent Variables</b>   |   |      |      |      |      |   |
| Central Government Spending  | Central government final consumption expenditure, calculated by economic function. Measured as share of GDP.  | 21.5 | 10.4 | 33.8 | 5.1  | IMF Government Finance Statistics (GFS)                             |
| General Government Spending  | General government final consumption expenditures including all government current expenditures for purchase of goods and services, compensation of employees, as well as national defense & security. Measured as share of GDP | 12.8 | 2.9  | 22.7 | 3.7  | World Bank, World Development Indicators                            |
| <b>Independent Variables</b> |   |      |      |      |      |   |
| Regional Income Inequality   | Measure of regional income disparity, using the country's average GDP per capita, the GDP per capita of subnational regions. Formulae from Lessman (2009).  |      |      |      |      |   |
| COVW                         | The population-weighted coefficient of variation of regional GDP per capita. Units are proportions (rescaled to percentage points).   | .47  | .20  | .85  | .14  | Calculated by Author using National Accounts                        |
| Gini Coefficient             | Estimates of the Gini index of household market (pre-tax, pre-transfer) income inequality, using Luxembourg Income Study data. Units are scales of 0 to 100 (the most unequal).   | 50.5 | 40.7 | 71.3 | 4.2  | Standardized World Income Inequality Database (SWIID), Solt (2009). |
| <b>Control Variables</b>     |   |      |      |      |      |   |
| Population (Logged)          | Log of Population (in millions).  | 3.1  | .67  | 5.3  | 1.2  | Penn World Table 8.0  |
| GDP per capita (Logged)      | Log of GDP per capita (Constant 2005 \$US), adjusted for purchasing power parity  | 8.8  | 7.9  | 9.6  | .36  | World Development Indicators.                                       |
| Trade (% GDP)                | Sum of imports and exports divided by nominal GDP   | 52.6 | 11.5 | 198  | 39.5 | World Development Indicators.                                       |
| % Population > 65            | Population age 65 and above (% of total population)   | 5.5  | 3.5  | 10.7 | 1.8  | World Development Indicators.                                       |
| Ethnic Fractionalization     |   | .53  | .19  | .74  | .18  | Alesina et al. 2003   |
| Federal System               | 2 if both sub-national legislature and executive are elected; 1 if legislature is elected; 0 otherwise  | 1    | 0    | 2    | .9   | Database of Political Institutions                                  |
| Personal Vote Index          | Ranking on 13 components (ballot structure, pool structure, ballot type, district magnitude, tier system, proportionality) of Personal Vote based on Carey and Shugart (1995)   | 5    | 1    | 13   | 3.3  | Johnson and Wallack (2007)  |

**Table 2A: Personal Vote Rank in Latin American Sample**

| <b>Country</b> | <b>Minimum Rank</b> | <b>Maximum Rank</b> |
|----------------|---------------------|---------------------|
| Argentina      | 1                   | 1                   |
| Bolivia        | 1                   | 10                  |
| Brazil         | 7                   | 7                   |
| Chile          | 5                   | 5                   |
| Colombia       | 12                  | 12                  |
| Ecuador        | 1                   | 3                   |
| Mexico         | 6                   | 6                   |
| Panama         | 6                   | 6                   |
| Peru           | 5                   | 5                   |



**Figure 1A: Change in Regional Inequality 1990-2010**



**Table 3A: Regional Inequality Dynamics in Latin American Sample**

|                  | <b>Standard<br/>Deviation</b> | <b>Minimum</b> | <b>Maximum</b> | <b>% Difference,<br/>Min and Max</b> |
|------------------|-------------------------------|----------------|----------------|--------------------------------------|
| <b>Argentina</b> | 0.053                         | 0.483          | 0.672          | 0.392                                |
| <b>Bolivia</b>   | 0.064                         | 0.201          | 0.390          | 0.935                                |
| <b>Brazil</b>    | 0.045                         | 0.471          | 0.578          | 0.226                                |
| <b>Chile</b>     | 0.062                         | 0.375          | 0.558          | 0.490                                |
| <b>Colombia</b>  | 0.032                         | 0.362          | 0.480          | 0.326                                |
| <b>Ecuador</b>   | 0.047                         | 0.536          | 0.678          | 0.264                                |
| <b>Mexico</b>    | 0.097                         | 0.557          | 0.847          | 0.520                                |
| <b>Panama</b>    | 0.020                         | 0.464          | 0.526          | 0.133                                |
| <b>Peru</b>      | 0.017                         | 0.461          | 0.516          | 0.119                                |

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